

ORIGINAL ARTICLE

The diagnostic value of ultrasound compared with nerve conduction velocity in carpal tunnel syndrome

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Abstract

Objective: Carpal tunnel syndrome (CTS) is the most common form of peripheral entrapment neuropathy. The use of sonography for investigation and diagnosis of musculoskeletal conditions has been rapidly increasing over the past few decades. The purpose of this study was to determine whether sonography can be an alternative method to nerve conduction study (NCS) in the diagnosis of CTS.

Methods: Individuals with electrodiagnostically proven CTS and healthy control subjects were enrolled prospectively. Median nerve cross-sectional area (CSA) and flattening ratio (FR) at three different levels, proximal to tunnel inlet, at tunnel inlet and tunnel outlet, and flexor retinaculum thickness, were measured. Then, comparisons between ultrasonography and NCS were made.

Results: We assessed 180 wrists, of which 120 were electrophysiologically confirmed as CTS diseased hands and 60 nondiseased hands in 90 patients (83 women and seven men). The mean median nerve CSA at the tunnel inlet was $13.31 \pm 3.23 \text{ mm}^2$ in CTS diseased hands and $8.57 \pm 0.82 \text{ mm}^2$ in nondiseased hands. *Post hoc* comparisons between the diseased and nondiseased hands demonstrated that the CSA at various levels of the median nerve were significantly greater in the CTS diseased hands than the nondiseased hands ($P = 0.001$). CSA at the tunnel inlet with a threshold of 9.15 mm^2 gave the best diagnostic accuracy with a sensitivity and specificity of 99.2% and 88.3%, respectively. The difference in cross-sectional area of the median nerve in mild, moderate and severe CTS was statistically significant.

Conclusion: Ultrasonographic measurement of the CSA of the median nerve at the carpal tunnel inlet is useful in diagnosing and grading CTS.

Key words: carpal tunnel syndrome, diagnosis, nerve conduction velocity, ultrasonography.

INTRODUCTION

Carpal tunnel syndrome (CTS) or compression neuropathy of the median nerve at the wrist is the most

common form of peripheral entrapment neuropathy.¹ The pathophysiology of CTS is multifactorial. Increased pressure in the intracarpal canal plays a key role in the development of clinical CTS.² The estimated annual incidence of CTS per 100 000 population ranges from 324 to 542 for women, and 125 to 303 for men.^{3,4} Depending on its definition, the estimated prevalence of CTS in the general population is 1–5%.^{5,6} CTS is more frequent in women (0.7–9.2%) than in men

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